Description of a new species of *Marginella* (Volutacea: Marginellidae) from the Gulf of Guinea

F. BOYER [1], P. RYALL [2] & A. WAKEFIELD [3]

[1] 110, Chemin du Marais du Souci, 93270 Sevran, France.
[2] P.O. Box 224, Takoradi, Ghana.
[3] 14 Forest Side, Buckhurst Hill, Essex, 1G9 5SL, England.

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ABSTRACT. The taxa belonging to the group *Marginella tyermani* Marrat, 1876 are reviewed. *M. keppeli* Sykes, 1905 and *M. eveleighi* Tomlin & Shackleford, 1913 are defined as synonyms of *M. tyermani*. *Marginella xicoi* n.sp. is described from the Ghanaean coast and is related with other species to a "complex *M. tyermani*".

RÉSUMÉ. Les taxa appartenant au groupe *Marginella tyermani* Marrat, 1876 sont revisées. *M. keppeli* Sykes, 1905 et *M. eveleighi* Tomlin & Shackleford, 1913 sont placés en synonymie de *M. tyermani*. *Marginella xicoi* n.sp. est décrite de la côte du Ghana et est reliée avec d'autres espèces à un "complexe *M. tyermani*".

INTRODUCTION

In February 1995, whilst dredging west of the mouth of the Volta River, Ghana (Fig. 1), the second author discovered several specimens of a small species belonging to the genus *Marginella* and considered by us as new to science.

Our new species presents evident similarities to taxa belonging to the group *Marginella tyermani*, so we propose their preliminary revision as a necessary step to the determination of our new species.

This century, very few works have dealt with Marginellids from the Gulf of Guinea. The principal ones are:

- KNUDSEN (1956), for scattered samplings in deep waters during the campaign of the vessel 'Atlantide'.
- TOMLIN & SHACKLEFORD (1913), GOFAS & FERNANDES (1988), and FERNANDES & ROLAN (1991) for shallow water samplings in Sao Tome and Principe.
- BERNARD (1984), for material mostly collected from shallow and moderate depths in Northern Gabon.

The paucity of scientific works on the subject clearly illustrates the very limited knowledge of the Marginellid fauna from the Gulf of Guinea. The southern part is perhaps best known, but even then only a few kilometers of coastline have been studied.

The results of some recent collecting trips along the northern coasts of the Gulf of Guinea (ROLAN & FERNANDES, 1977 ; P. Ryall, personal material and records) suggest that the claimed "poor diversity" of the marine molluscan fauna in this area could be a superficial and inaccurate point of view. The traditional view of Atlantic equatorial coasts, with their warm, muddy water, long sandy beaches and heavily rolling waves is of a generally inhospitable environment unable to support more than a few hardy species and occasional very specialised ones. The reality seems to be very different, as the benthic equatorial environment of the continental shelf in the Atlantic generally presents a high level of organic content as well as important heterogeneity of habitats and communities along hard and soft bottoms. Therefore it is probably necessary to re-evaluate the real diversity of the molluscan fauna in the Gulf of Guinea, with the help of future field studies, collecting, and an accurate examination of available material. The study of our newly discovered species is conceived as a contribution to this knowledge.

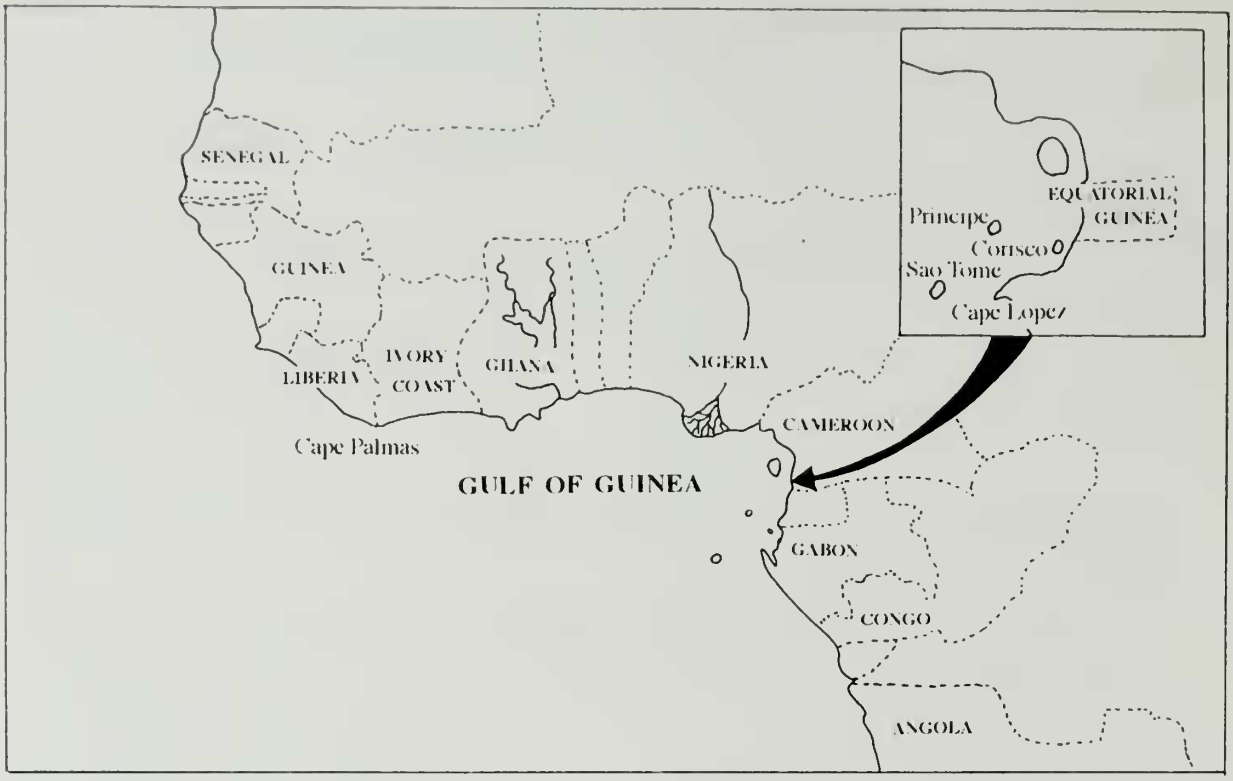

Fig. 1. Map of Central West Africa.

SYSTEMATIC ACCOUNT

Genus *Marginella* Lamarck, 1799

Type species: ***Voluta glabella*** Linne, 1758, by monotypy.

Marginella tyermani Marrat, 1876
Figs. 2-7

Original designation.

MARRAT, 1876. p. 136.

Original description.

"Marg. Testa subfusiformi – ovata, cinereo – alba, lineis nigris, spira brevi, antifractibus superne obtuse angulatis, ad angulum plicato – nodulatus, columella quadriplicata, labro late incrassato, intus denticulato".

"Var. with the lip smooth inside. The Corisco specimen. Found in company with *M. belli*, Sow., and is about the size of *M. festiva,* Kiener. Hab. 1. Corisco Bay, 1. Near Cape Palmas, West Africa. Coll. Keen, Liverpool".

Type material.

The description of the species referred to two non-figured specimens, from Coll. Keen, Liverpool, both present now in the collection of F.P. Marrat, Liverpool Museum, England: a larger, rather worn specimen, 11.20 x 5.90 mm (Figs. 2 & 3), and a smaller more glossy specimen, 8.55 x 5.00 mm (Figs. 4 & 5).

MARRAT (1876) designated the one "with the lip smooth inside" as being a variety ("Var."), and noted the locality as Corisco Bay, which presently is situated in Equatorial Guinea, on the border with Gabon. We therefore have to infer that the other specimen said to come from Cape Palmas, presently on the border between Liberia and Ivory Coast, represents the typical form and has to be considered as the holotype.

In reality the distinction between the typical and the varietal form is not apparrent, as neither of the shells has a smooth inner lip. The Latin text of the description is also contradictory; the shell is said to be light grey, to have a short spire and a widely thickened labrum, whereas in fact the larger specimen is light tan coloured with a tall spire and strongly thickened labrum with deep internal denticulations. The smaller specimen is light greenish grey, with a short spire and a moderately thickened labrum. So, it seems that the text of the description mixes up characteristic features of both shells, and does not really present the individual features of a single "typical specimen". Furthermore,

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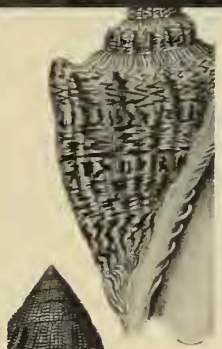





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Figs. 2-3. *M. tyermani* Marrat, holotype, Cape Palmas. Liverpool Museum Type Collection, 11.20 x 5.90 mm. **Figs. 4-5.** *M. tyermani* Marrat, varietal specimen of author, Corisco. Liverpool Museum Type Collection, 8.55 x 5.00 mm. **Fig. 6.** *M. tyermani* Marrat, Ivory Coast. Coll. F. Boyer, 7.40 x 4.50 mm. **Fig. 7.** *M. tyermani* Marrat, Banie I., Gabon. Coll. F. Boyer, left to right: 12.20 x 6.30 mm, 9.00 x 5.60 mm, 7.30 x 4.15 mm.

the labels attached to these specimens do not allow us to be absolutely certain of the geographical origin given by MARRAT for each shell, and the mention of the word "type" attached to the larger specimen seems to have been attributed later, probably by TOMLIN who examined this material first in early 1913 and again in June 1936.

TOMLIN left a label certifying the authenticity of the type specimens of *M. tyermani*, and the type localities, and he also added: ".....but it is not stated from which loc. the type came." In 1913, TOMLIN considered as evident that the type specimen was the larger one. He commented that it was "rather worn" and with "an unusually thickened outer lip, which emphasises the internal denticulation." It seems apparent that TOMLIN, as the first revisor, did not designate a lectotype from undiscriminated original material, but recognised an evident holotype as such.

Despite the ambiguity of the original description, we follow Tomlin in recognising the largest shell as the holotype, as the strongly denticulated outer lip can be considered a distinctive feature, as opposed to the moderately denticulated outer lip of the smaller specimen, which can more easily be attributed as having a "smooth lip".

In conclusion, the larger specimen belonging to the Marrat Collection has to be considered as the holotype of the species, whereas the smaller specimen, being representative of a "variety" of the species, cannot be included amongst the type material.

Type locality.

Cape Palmas (Liberia).

Other material examined.

- One live collected specimen, dredged 25-30m off Cape Palmas, Liberia, 1996. Coll. P. Ryall (ex. Coll. Nora, Porto). The shell is pure milky white except for the first whorls which are greyish-brown, the surface of the body whorl is perfectly smooth, without tendeney to any axial ribbing. The shoulder is rounded and does not present any angle or crenation. The inner labrum is moderately denticulate. 10.60 x 6.04 mm. Morphologically this specimen matches with the typical form of *M. tyermani*. Its origin is, however to be confirmed.

- One live collected specimen, off Ivory Coast, Coll. F. Boyer, 7.05 x 4.35 mm, live collected, (Fig. 6). This specimen matches the specimen illustrated in KNUDSEN (1956: pl II, Fig. 17) as *M. musica*, and does have a perfectly smooth labrum which could of course represent an immature phase of shell development. The blunt spire of this specimen bears a very low and wide protoconch. The background colour is greenish with black marks and axial flammules.

- Three large specimens from Punta Eviondo, Rio Muni, (currently Equatorial Guinea). Coll. F. Boyer: 11.15 x 6.00 mm, 10.05 x 5.45 mm, 10 x 5.50 mm. Shell colour varying from greenish-yellow to greenish-grey with dark spiral lines and blurred axial marks, sometimes more dense and arrow shaped under the shoulder.

- From the Komo Estuary and Banie Island, Gabon, Coll. F. Boyer: one large (12.20 x 6.35 mm), and sixteen smaller shells (7.15 to 9.00 mm in length). All adult shells, from shallow water. The shells from Banie Island exhibit the greatest diversity of colour from near all black to near all white. All have a denticulated labrum, except for the larger specimen from Banie Island, which is a young adult with a thin lip and no denticulations. The labial denticles appear to be a sign of maturation, and may disappear again when the animal reaches the gerontic stage, the lip becoming even more thickened.

- Off Banie Island, Gabon, Coll. P. Ryall. Many small to large specimens collected at 2-4 metres on fine sand.

The 18 specimens attributed to *M. tyermani* figured in the book 'Shells of Gabon' (BERNARD, 1984) present the range of colour variation for the species in Northern Gabon, from dark black through yellow, grey, tan and white forms, with or without a black central band on the body whorl. BERNARD (1984) does not, however, comment on the morphologic variation of the species (outline, proportions of the spire and labrum, strength and number of denticles), just giving 10 mm as being the maximum size reached by the shell. Observed populations are said to be found on sand at 0-5 metres, in Banie Island, Komo Estuary, and Port Gentil, Gabon.

Remarks.

As far as shell characters are concerned, the range of variability presented by *M. tyermani* in Equatorial Guinea and Northern Gabon includes both the typical form of the species (the large specimen with a slender spire said to come from Liberia) and the varietal form of Marrat (the squatter specimen with a short spire said to come from Coriseo Bay). Intergrades between these two forms are fully represented, both for morphological features and colouration of the shell.

The specimen figured in KNUDSEN (1956: p.91, pl. II, fig. 17) and assigned to *M. musica* Hinds, was collected by the Atlantide Expedition (1945-1946), at station 98, 5 56' N, 4 26' E, 100 metres deep. This station is located off the coast of Nigeria. The shell figured measures 7.30 x 4.40 mm and has a very low conical spire, five black spiral lines on the body whorl, a relatively wide aperture, and a thin labrum with a faintly denticulated inner part. Knudsen describes the shell as being "greyish white with a white band at the suture". This shell clearly belongs to the species *M. tyermani*, even if it bears unusual spire morphology (it is comparable with one end of the natural range of variation of the populations observed from Northern Gabon). It also seems to be a dead shell, possibly transported to deeper levels by strong ocean currents, and its lack of axial decoration on the body whorl coupled with the presence of spiral lines, probably led to its incorrect identification as *M. musica*.

Marginella keppeli Sykes, 1905

Fig. 8

Original designation.

SYKES, 1905, pp. 315-316, pl. XVII, fig. 3.

Type material.

One syntype in BM(NH), London, coll. Sykes, not examined, described as measuring 9.5 x 5 mm.

Type locality.

West Africa.

Remarks.

The original figure and description of *M. keppeli* Sykes both perfectly fit into the range of natural variation of *M. tyermani* Marrat, concerning morphology of the shell, size and decoration. TOMLIN (1913, 1917) synonymized *M. keppeli* Sykes with *M. tyermani* Marrat, and we follow him in this conclusion.

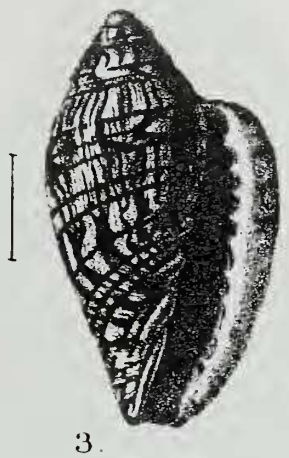

Fig. 8. *M. keppeli* Sykes. Original figure.

Marginella eveleighi

Tomlin & Shackleford, 1913.

Fig. 9

Original designation.

TOMLIN and SHACKLEFORD, 1913, p. 11, Type figure in TOMLIN, 1913, pl. I, figs. 5-6.

Type material.

One syntype in the Tomlin-Melvill Collection (National Museum of Wales, Cardiff). Not examined. Described as measuring 7.25 x 4.00 mm. Type specimen drawn as holotype in GOFAS & FERNANDES (1988), length 6.20 mm.

Type locality.

"S. Thome Island, Gulf of Guinea. Scarce, in coral gravel."

Other material examined.

- One adult specimen from Sao Tome, Coll. F. Boyer, 7.50 x 4.00 mm. Black and white background.

- Three adult specimens and a fragment, Esprainha and Sao Tome City, Sao Tome Island, Coll. P. Ryall, collected in 1-3 metres under rocks.

Other material quoted and illustrated.

- Several shells and specimens referred to as *M. eveleighi* in KNUDSEN (1956, p. 84, pl. III, fig. 2), through 7 stations of the Atlantide Expedition:

One station off Monrovia (Liberia) in 10 metres (Stat. 52).

Five stations off the Niger delta (Nigeria), in 19 to 50 metres (Stat. 100, 104, 111, 112, 113). The shell figured in plate III is the one taken in 32 metres at station 113. The type of substrate was not recorded for these stations, with the exception of station 112 which is described as "clayish mud". In a previous work on the Atlantide material, KNUDSEN (1950, pp. 112-114, fig. 20 C-D) recorded the discovery of "15 oval and rather domed" egg capsules adhering to the surface of a decaying leaf, from 50 metres at station 104, and labelled as " *M. eveleighi*". However, although these egg capsules were found at the same station as a live specimen of "*M. eveleighi*", it does not necessarily mean that the egg capsules belong to this taxon. The comparison made between the embryo and the apex of *M. eveleighi* is similarly unconvincing. The white larval shell has no decorative features, and its very long and oblique anterior columellar plait (well separated from the other three smaller and more closely grouped ones) better suggests that it belongs to another species.

Fig. 9. *M. eveleighi* Tomlin and Shackleford. Original figure.

On the other hand, KNUDSEN (1950, pp. 115-116, fig. 22 E-D) records the discovery of 8 egg capsules "of the plano-convex type" in 40 m at stat. 103, labelled as "*Marginella sp.*". The larval shell is decorated on the last half whorl by "three dark transverse bands crossed by a single longitudinal one". These egg capsules and larval shells are quite likely referrable to the phena "*M. eveleighi*", even if the spiral black line is generally situated just under the suture of the first whorls, rather than in a more anterior position as seems to be the case in the figure 20 E-D.

One station off Luanda (North Angola) in 42 m (stat. 136, St. Paul de Loanda, mud). The occurence of *M. eveleighi* in this place is not confirmed by GOFAS & FERNANDES (1994), who intensively dredged at this depth over many years. So this shell collected by the Atlantide Expedition could possibly be a juvenile shell of *M. lucani* Jousseaume, 1884 (which is known to live from Southern Gabon to Northern Angola in shallow water, Fig. 10) or perhaps more probably, it is a juvenile specimen of *M. fumigata* Gofas and Fernandes, 1994, which lives in the same area but at deeper levels (type loc. : 40-50 m off Luanda).

[N.B. One single datum is quoted by KNUDSEN (1950) for measurements of the shells: height 10.70 mm. This length probably concerns the shell taken at St. 113 and figured in plate III].

- Five shells referred to as *M. eveleighi* in BERNARD (1984, pp. 88-89, pl. 39, no. 157), but looking very similar to the specimens presented as *M. tyermani* (no. 159) except for their larger size. These large specimens are said to live on sand in 2-5 m, only off Banie Island. BERNARD notes that the specimens of *M. eveleighi* bear few axial ribs, and that the specimens of *M. tyermani* are smooth. However, the figures of both species clearly show moderate to strong axial ribbing along their shoulders.

In fact, the specimens designated as *M. eveleighi* in BERNARD (1984), represent the taller variant of *M. tyermani*. Large specimens over 10 mm are not found in the Komo Estuary and Port Gentil. They are moderately rare in Banie Island, and seem to be more common in Equatorial Guinea. This kind of geographic or bathymetric cline in size range is commonly seen in many species of marine gastropods. The relative rarity of these larger specimens of *M. tyermani* in the field explains why they are poorly represented in collections, and also explains why they exhibit the most common pattern of decoration of the species (fine spiral black lines on a greyish -green background and a central black band on the body whorl). Within individual stations all size intergrades exist, so there is no need to subdivide the species on a morphological or taxonomic basis. In fact the holotype of *M. tyermani* is 11.20 mm long and itself links (if it is necessary to prove this) the smaller shells to the larger ones referred to in BERNARD.

- Several specimens and shells recorded in GOFAS & FERNANDES (1988, pp. 11-13, figs. 12-13) as *M. eveleighi* : 22 specimens from Sao Tome in Coll. F. Fernandes, Angola ; 1 specimen from Calypso cruise "Gulf of Guinea", in the Paris Museum (MNHN) ; 10 specimens from Gabon, ex-Coll. P. Bernard, in the Paris Museum (MNHN). All these shells from both Sao Tome and Gabon are 6 to 9 mm in length, and present a homogenous morphology and colour pattern "...with a rather high conical spire and axial folds on the shoulder. Outer lip stongly thickened, with 11-12 denticles. Colour pattern of black spiral lines, which can be interrupted, and irregular longitudinal flames, on a greyish or whitish background." The live animal of *M. eveleighi* is also described and illustrated in GOFAS and FERNANDES (1988, colour plate 1. fig. b.) of specimens from Sao Tome : "Foot translucent, with small yellow spots grading towards the inner areas to larger, paler cream-yellow blotches. Head and tentacles with a series of yellow spots. Siphon densely covered with yellow blotches, with slightly more intense hue than head and foot".

Fig. 10. *M. lucani* Jousseaume. Banana, Congo. Coll. F. Boyer, 15.70 x 8.90 mm.